



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

January 27, 2021

Micah T. Reynolds  
Senior Regulatory Consultant  
Organisan Corporation  
P.O. Box 2085  
Carrollton, GA 30112

Subject: Non-PRIA (Pesticide Registration Improvement Act) Labeling Amendment – Acceptable Revisions to Add Insects and Plant Disease Pests, Seed Treatment Application Options, Crop Use Sites, and Marketing Claims.  
Product Name: Nemasan  
EPA Registration Number: 92032-1  
Application Date: 01/17/2020  
OPP Case Number: 00074856

Dear Mr. Reynolds:

The amended labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable.

This approval does not affect any terms or conditions that were previously imposed on this registration. You continue to be subject to existing terms or conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one (1) copy of the final printed labeling before you release this product for shipment with the new labeling. In accordance with 40 CFR § 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR § 152.3.

Should you wish to add/retain a reference to your company's website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the U.S. Environmental Protection Agency (EPA). If the website is false or misleading, the product will be considered to be misbranded and sale or distribution of the product is unlawful under FIFRA section 12(a)(1)(E). 40 CFR § 156.10(a)(5) lists examples of statements the EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration

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process. Therefore, should the EPA find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA-approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance Assurance.

Your release for shipment of this product constitutes acceptance of these terms. If these terms are not complied with, this registration will be subject to cancellation in accordance with FIFRA section 6.

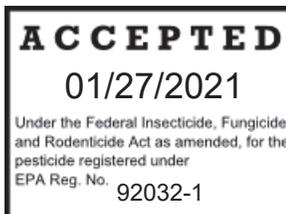
If you have any questions, please contact Alex Horansky by phone at (703) 347-0128 or via email at [Horansky.alex@epa.gov](mailto:Horansky.alex@epa.gov).

Sincerely,



Andrew Bryceland, Team Leader  
Biochemical Pesticides Branch  
Biopesticides and Pollution  
Prevention Division (7511P)  
Office of Pesticide Programs

Enclosure



# NEMASAN

**(Alternate Brand Names: ChitoPro, ChitoPro-I, ChitoPro-F, OmniCoat, OmniKote, TriKoat, TriKote)**

Biological Nematicide, Insecticide, and Fungicide

For (effective) control/ suppression of plant-parasitic nematodes in the soil, listed insect pests, and listed plant diseases

For application to turf, fruit, vegetables, ornamentals, and row crops

For application as a seed treatment to control [plant-parasitic] nematodes and listed plant diseases

Nematode Suppression/Control

[Suppresses] [Controls] listed insects, soil and foliar fungal pathogens

[Label Reviewer Notes: Optional claims are also listed on last page]

**Active Ingredients:**

Quillaja Extract\* ..... 8.0%  
Chitosan..... 2.0%

**Other Ingredients**..... 90.0%

**Total** ..... 100.0%

\*Product contains 0.69% Saponins of *Quillaja saponaria*

**KEEP OUT OF REACH OF CHILDREN**  
**DANGER            PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

<b>FIRST AID</b>	
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15–20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>
<b>HOT LINE NUMBER</b>	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-222-1222 for emergency medical treatment information.	

See [back] [side] [other] [panel] [booklet] [insert] for additional information [precautionary statements] [and] [directions for use].

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**EPA Establishment No.** \_\_\_\_\_

**Net Contents: [X oz.] [X quart(s)] [X gallon(s)] [2 x X gallons]**

(Note to reviewer: the appropriate bracketed net content unit will be used on the commercial label.)

Manufactured exclusively for:



PO Box 2085  
Carrollton, GA 30112

## PRECAUTIONARY STATEMENTS

**HAZARDS TO HUMANS AND DOMESTIC ANIMALS - DANGER.** Corrosive. Causes irreversible eye damage. Do not get in eyes or on clothing. Wear goggles or face shield. After product is diluted in accordance with the directions for use, goggles or face shield is not required. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

#### Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4 hours.

PPE required for early entry to treated areas (that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water), is:

- Long-sleeved shirt and long pants
- Shoes plus socks

### [NEMATICIDAL] [FUNGICIDAL] [INSECTICIDAL] USE INSTRUCTIONS

Nemasan [this product] is a [nematicide], [fungicide], [and] [insecticide] for use on agricultural crops against the pests listed in the Directions for Use section. Apply Nemasan [this product] as a soil treatment to control listed soil-borne [pests] [diseases] [and larvae of pests], and apply Nemasan [this product] as a foliar spray or as a soil treatment (soil drench, in-furrow, drip-applied) to control listed [insect pests], [nematodes], [and] [plant diseases]. For seed treatment uses, please refer to the Seed Treatment Use Instructions.

### Mixing Directions

Follow manufacturer's guidelines for cleaning spray equipment prior to mixing. Fill tank to desired amount with water, add all other spray components and agitate as directed. Buffer the mixture to pH 5.0 or below before adding Nemasan. Start the mechanical or hydraulic agitation to provide moderate circulation before adding Nemasan. Add the desired volume of Nemasan to the mix tank and the remaining volume of water and continue circulation. Maintain circulation while loading and spraying. (Excessive agitation may lead to foaming of spray solution.) Do not mix more Nemasan than can be used in 24 hours.

### Tank Mixing

Do not combine Nemasan [this product] in the spray tank with other pesticides, surfactants, adjuvants, or fertilizers if there has been no previous experience or use of the combination to show it is physically compatible, effective, or non-injurious under your use conditions.

To ensure compatibility of tank-mix combinations they must be evaluated prior to use. To determine the physical compatibility of this product with other products use a jar test. Using a quart jar, add the proportionate amounts of the products to one quart of water with agitation. Add dry formulations first, then flowables second, then emulsifiable concentrates last. After thoroughly mixing, let this mixture stand for 5 minutes. If the combination

remains mixed or can readily be remixed, it is physically compatible. Once compatibility has been proven, use the same procedure for adding required ingredients to the spray tank.

### Nematicide Application Instructions (Soil and Foliar)

Apply Nemasan [this product] to the soil as a pre-plant, at planting or post-plant soil treatment on annual and perennial crops (refer to Directions for Use Table) alone, or applied through drip or border irrigation systems. Best results will be obtained from pre-plant applications close to the actual planting times. The optimal application time must be determined based on the cultural practices and the nematode population dynamics. Nemasan [This product] is formulated to work in synergy with resident soil microflora to enhance an environment that is detrimental to nematodes. For application areas that have undergone recent or multi-season soil fumigant applications for sterilization, initial Nemasan [product] effectiveness and nematode suppression/control may be impacted, For treatment areas that have recent or multi-season soil fumigant applications, more frequent Nemasan [product] applications may be needed for optimum nematode population control.

For perennial crops, apply Nemasan [this product] just prior to a root flush to protect young roots. Multiple applications may be required for crops with multiple root flushes. Nemasan [This product] may be applied to and incorporated into the soil. Incorporation may be accomplished by mechanical equipment, irrigation or rainfall. For soil applications made at planting, the action of some planters may provide sufficient incorporation. When using planters which do not provide adequate incorporation of Nemasan into the soil, equipment designed for incorporation may be used behind the planter.

Close scouting and early attention to infestations is highly recommended. Proper timing of application targeting newly hatched larvae, eggs or immature pests is important for optimal results.

Nemasan [This product] can be applied to bare soil alone or with most types of pesticides and nutrients prior to planting, at planting, at transplant, in-season, pre- and post-harvest. Apply with a minimum of 10-30 gallons of water per acre to ensure complete coverage. Use a jar test to confirm physical compatibility prior to application. Apply 1-2 pints of Nemasan [product] per acre. Applications can be made by following methods:

Pest	Application Timing	Application Method	Rate	Comments
Root-lesion nematode <i>Pratylenchus spp.</i>	Before Planting	Drenching, drip (trickle) or sprinkler application	Apply 1-2 pints of product per acre	Pre-plant applications may be either broadcast over an entire field or concentrated (banded) into planting rows. Apply when soil temperature at 4-inch depth is 60°F or higher. Bioactivity of Nemasan is greatest at soil temperatures between 70° and 90°F. Apply to nematode-infested (non-fumigated) soil up to 14 days before planting or transplanting. Retreat every 7 to 21 days as needed for control.
Root-knot nematode <i>Meloidogyne spp.</i>	At Planting	Surface spray on moist soil with 40-100 gallons water/acre		
Reniform nematode <i>Rotylenchulus spp.</i>	Transplanting	Surface spray with 20-40 gallons water/acre followed by overhead irrigation. Use enough irrigation water to wet the soil into the root zone.		
Sting nematode <i>Belonolaimus spp.</i>	In Season			
Stem nematode <i>Ditylenchus spp.</i>	Pre-Harvest	Direct injection to anticipated root depth using shank or other soil injection equipment. Apply with 30-40 gallons water/acre.		
Gall nematode <i>Agnuiina spp.</i>	Post-Harvest			
Soybean Cyst Nematode <i>Heterodera spp.</i>				
Spiral nematode <i>Helicotylenchus spp.</i>				
Lance nematode <i>Hoplolaimus spp.</i>				
Guava nematode <i>Meliodogyne spp.</i>				
Potato cyst nematode <i>Globodera spp.</i>				

### Insecticide/Miticide Application Instructions (Soil and Foliar)

Apply Nemasan [product] in sufficient amount of water and adequate spray pressure to achieve thorough coverage of plant surfaces to listed crops to control listed insect pests, including aphids, thrips, psyllids, mites, and beetles. Nemasan [this product] is most effective when applied before or around the onset of insects, mites, or their eggs or as soon as pest emergence is evident. For application areas that have undergone recent or multi-season soil fumigant applications for sterilization, initial Nemasan [product] effectiveness and insect suppression/control may be impacted, For treatment areas that have recent or multi-season soil fumigant applications, more frequent Nemasan [product] applications may be needed for optimum insect population control. Apply Nemasan [product] at a rate of 1-2 pints per acre in a minimum of 10-30 gallons of water to ensure adequate coverage. Ensure that both the top and bottom of leaves are wetted but not to the point of runoff. For optimum results, repeat the applications at intervals of 7 to 21 days. Use higher rates and increase spray frequency when pest pressure is high. Use any powered or manual conventional spray application equipment including high volume, low volume, ultra-low volume, backpack, or chemigation (refer to Chemigation section of the label). For all applications, follow the original equipment manufacturer's instructions.

Insect Pest	Application Timing	Application Method	Rate	Comments
White flies - egg, nymph Aphids - all life stages, not adult Thrips - egg, larvae, prepupal, pupal Stink Bugs - egg, nymph Plant Bugs - egg, nymph Psyllids - egg, all 5 instar Wireworms - egg, larvae Corn Borers - egg, larvae Corn Root Worm - egg, larvae instars Southern Cow Pea Weevil - egg, larvae, maggot Pea Weevils (Curcula) - all life stages, not adult Mites - all life stages, not adult Sugarcane Aphids - all life stages, not adult Corn Ear Worm - all life stages, not adult Corn Root Maggot - all life stages, not adult Borers - all life stages Pine Beetles Snails & Slugs - all life stages Grasshoppers - egg, larvae Colorado Potato Beetle Cereal Leaf Beetle Wireworm Leaf Miners Mealy Bugs Crickets - egg, larvae	At earliest sign of pest intrusion	In-Furrow, Soil or Foliar Drench, drip (trickle) or sprinkler application pre-plant, post-plant, post-emergence, in-season, pre-harvest  Surface spray with 10-30 gallons water/acre	Apply 1-2 pints of product per acre	Retreat every 7 to 21 days as needed for control.

### Fungicide Application Instructions (Soil and Foliar)

Apply Nemasan [product] in sufficient amount of water and adequate spray pressure to achieve thorough coverage of plant surfaces to listed crops to control listed plant and turf diseases, including rot, *Phytophthora spp*, and *Fusarium spp*. Nemasan [This product] is most effective when applied before or around the onset of disease

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occurrence. For application areas that have undergone recent or multi-season soil fumigant applications for sterilization, initial Nemasan [product] effectiveness and disease suppression/control may be impacted, For treatment areas that have recent or multi-season soil fumigant applications, more frequent Nemasan [product] applications may be needed for optimum disease control. Apply Nemasan [product] at a rate of 1-2 pints per acre in a minimum of 10-30 gallons of water to ensure adequate coverage. Ensure that both the top and bottom of leaves are wetted but not to the point of runoff. For optimum results, repeat the applications at intervals of 7 to 21 days. Use higher rates and increase spray frequency when pest pressure is high. Use any powered or manual conventional spray application equipment including high volume, low volume, ultra-low volume, backpack, or chemigation (refer to Chemigation section of the label). For all applications, follow the original equipment manufacturer's instructions.

Plant Disease	Application Timing	Application Method	Rate	Comments
<b>Crop Diseases, including:</b> <i>Rhizoctonia spp. (R. solani)</i> Garlic and Onion White Rot Onion Pink Root Rot <i>Fusarium spp. (F. oxysporium, F. solani, F. graminearum)</i> <i>Aspergillus spp.</i> <i>Pseudomonas spp.</i> <i>Phytophthora spp.</i> <i>Phytophthora gummosis</i> Phytophthora Root Rot Bacterial Soft Rot Armillaria Root Rot Bacterial Blast Sooty Mold Alternaria Melanose Verticillium	At earliest sign of disease occurrence	In-Furrow, Soil or Foliar Drench, drip (trickle) or sprinkler application pre-plant, post-plant, post-emergence, in-season, pre-harvest  Surface spray with 10-30 gallons water/acre	Apply 1-2 pints of product per acre	Retreat every 7 to 21 days as needed for control.
<b>Turf and Sod Diseases, including:</b> Curvularia Leaf Spot Fairy Ring Anthracnose Brown Patch Gray Leaf Spot				

**FOR USE ON THE FOLLOWING CROPS FOR CONTROL/ SUPPRESSION OF SPECIFIED NEMATODES, INSECT PESTS, AND PLANT DISEASES**

**Pre-harvest Interval (PHI) = 0 days**

<b>Crop Grouping</b>	<b>(including)</b>
Cereal Grains	Barley, Buckwheat, Corn (sweet and field), Millet, Oats, Quinoa, Rice, Rye (annual and cereal), Sorghum, Milo, Wheat, Grain Amaranth
Berries and Small Fruit	Bayberry, Bearberry, Bilberry, Blackberry, Blueberry, Buffaloberry, Che, Chilean guava, Chokeberry, Cloudberry, Cranberry, Currant, Elderberry, Gooseberry, Grape, Huckleberry, Kiwifruit, Lingonberry, Loganberry, Mulberry, Raspberry, Strawberry
Brassica (Cole) Leafy Vegetables	Broccoli, Broccoli Raab, Brussels Sprouts, Cabbage, Chinese Broccoli, Chinese Cabbage (Bok Choy), Chinese Cabbage (Napa), Chinese Mustard Cabbage (Gai Choy), Cauliflower, Cavalo Broccolo, Collards, Kale, Kohlrabi, Mizuna, Mustard Greens, Mustard Spinach, and Rape Greens
Bulb Vegetables	Leek, Garlic, Onion (Bulb and Green) and Shallot
Citrus	Lemon, Orange, Lime, Grapefruit, Kumquat, Pummelo, Mandarin, Satsuma
Cotton	
Cucurbit Vegetables	Cucumber, Edible Gourds, Muskmelon, Cantaloupe, Pumpkin, Watermelon, and Winter and Summer Squash
Fruiting Vegetables	Tomato, Tomatillo, Pepper, Ground cherry, Pepino, Okra and Eggplant
Grass Forage, Fodder and Hay	Bermuda grass; bluegrass; and brome grass or fescue, Bahia grass ( <i>Paspalum spp.</i> ) Orchard grass, Timothy grass, Crested Wheat Grass, Intermediate Wheat Grass
Hemp	
Leafy Vegetables	Arugula, Celery, Corn Salad, Cress, Dandelion, Dock, Edible Chrysanthemum, Endive, Fennel, Head Lettuce, Leaf Lettuce, Parsley, Purslane, Radicchio, Rhubarb, Spinach and Swiss Chard
Legume Vegetables (Succulent or Dried)	Bean (Lupinus) (includes grain lupin, sweet lupin, white lupin, and white sweet lupin); bean (Phaseolus) (includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean); bean (Vigna) (includes adzuki bean, asparagus bean, blackeyed pea, catjang, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlong bean); broad bean (fava); chickpea (garbanzo); guar; jackbean; lablab bean; lentil; pea (Pisum) (includes dwarf pea, edible-podded pea, English pea, field pea, garden pea, green pea, snowpea, sugar snap pea); pigeon pea; soybean; soybean (immature seed); sun hemp; sword bean
Oilseed Crops	Rapeseed, canola, sunflower, safflower, flax seed, cottonseed, sesame, borage, calendula, castor oil plant, crambe, cuphea, echium, euphorbia, evening primrose, gold of pleasure, hare's ear mustard, jojoba, lesquerella, lunaris, meadowfoam, milkweed, mustard seed, niger seed, rose hip, oil radish, poppy seed, stokes aster, sweet rocket, tallowwood, tea oil plant, vernonia
Ornamentals	Bare root, container bedding and landscape, shade and flowering trees, woody ornamentals
Peanut	
Pome Fruits	Apple, Crabapple, Loquat, Mayhaw, Pear, Quince
Root and Tuber Vegetables	Artichoke, Black Salsify, Carrot, Cassava, Celery, Chayote Root, Chicory, Chinese Artichoke, Edible Burdock, Garden Beet, Ginger, Ginseng, Horseradish, Jerusalem Artichoke, Oriental Radish, Parsnip, Potatoes, Radish, Rutabaga, Salsify, Skirret, Spanish Salsify, Sugar Beet, Sweet Potatoes, Tumeric, Turnip, Turnip-rooted Chervil, Turnip-rooted Parsley and Yams
Sugarcane	
Tobacco	
Tree Nuts	Almond, Beech nut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Coconut, Filbert (hazelnut), Hickory nut, Macadamia nut, Pecan, Pine nut, Pistachio, Walnut (black and English)
Tree Nurseries	Christmas trees, Fir, Pine, Oak, Spruce, Noble Fir, Scotch Pine, Balsam Fir, Douglas-Fir, Elm, Ash, Hickory, Poplar, Cedar, Locust, and other tree varieties for commercial use or reforestation
Turfgrass	Ornamental lawns, golf courses, sod farms

<b>Crop Grouping (Con't)</b>	<b>(including)</b>
Herbs and Spices	Allspice, Angelica, Anise, Star Anise, Annatto, Balm, Basil, Borage, Burnet, Camomile, Caper buds, Caraway, Cardamom, Cassia (buds and bark), Catnip, Celery seed, Chervil, Chive, Cinnamon, Clary, Clove buds, Coriander, Cilantro, Costmary, Culantro, Cumin, Curry, Dill, Fennel, Fenugreek, Grains of Paradise, Horehound, Hyssop, Juniper berry, Lavender, Lemongrass, Lovage, Mace, Marigold, Marjoram, Mustard, Nasturtium, Nutmeg, Parsley, Pennyroyal, Pepper (white and black), Rosemary, Rue, Saffron, Sage, Savory, Sweet bay, Tansy, Tarragon, Thyme, Vanilla, Wintergreen, Woodruff, Wormwood
Stalk, Stem, and Leaf Petiole Vegetables	Agave, Aloe Vera, Asparagus, Bamboo shoots, Cardoon, Celery, Celtuce, Fennel, Fern, Fuki, Kale, Kohlrabi, Palm hearts, Prickly pear, Rhubarb, Udo, Zuiki
Stone Fruits	Apricot, Capulin, Cherry, Jujube, Nectarine, Peach, Plum, Plumcot, Prune, Sloe
Hops	
Nongrass Animal Feeds	Alfalfa, Velvet Bean, Clover, Lespedeza, Lupin, Sainfoin, Trefoil, Vetch (crown and milk), Bahia grass ( <i>Paspalum spp.</i> )

## CHEMIGATION

### General Requirements:

- Apply [Nemasan] [this product] at 1 – 2 pints per acre as a pre-plant, at planting, post-plant soil treatment for control of nematodes or apply via foliar spray for treatment of listed insects and diseases.
- Apply [Nemasan] [this product] only through 1) overhead boom and mist-type systems, 2) sprinklers such as center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, impact or micro-sprinklers or hand-move systems, 3) pressurized drench (flood), furrow, border, or drip (trickle) systems, 4) micro-irrigation such as spaghetti tube or individual tube irrigation, 5) hand-held calibrated irrigation equipment such as hand-held wand with injector, and 6) ebb and flow systems. Do not apply this product through any other type of irrigation system.
- Crop injury or lack of effectiveness can result from non-uniform distribution of treated water.
- If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.
- Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
- A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

### Application Instructions for All Types of Chemigation:

- 1) Remove scale, pesticide residues, and other foreign matter from the chemical supply tank and entire injector system. Flush with clean water. Failure to provide a clean tank, void of scale or residues, may cause [Nemasan] [this product] to lose effectiveness or strength.
- 2) Determine the treatment rates as indicated in the directions for use and make proper dilutions.
- 3) To mix in supply tank, fill tank half way with water and add [Nemasan] [this product]. Stir until completely dispersed. Fill tank with remaining amount of water.
- 4) Application of [Nemasan] [this product] may be made continuously for the duration of the water application or can be applied at the end or after the water application.

### Requirements for Chemigation Systems Connected to Public Water Systems:

- 1) Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

- 2) Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, back flow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the flow outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
- 3) The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection.
- 4) The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- 5) The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
- 6) Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- 7) Do not apply when wind speed favors drift beyond the area intended for treatment.
- 8) Continuous agitation is not required in pesticide supply tanks unless tank mixing with other products or fluid fertilizers that require it.

#### **Sprinkler Chemigation Requirements:**

- 1) The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow.
- 2) The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- 3) The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- 4) The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- 5) The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- 6) Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- 7) Do not apply when wind speed favors drift beyond the area intended for treatment.
- 8) Continuous agitation is not required in pesticide supply tanks unless tank mixing with other products or fluid fertilizers that require it.

#### **Drip (Trickle) Chemigation Requirements:**

- 1) The system must contain a functional check valve, vacuum relief valve and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow.
- 2) The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- 3) The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- 4) The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- 5) The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- 6) Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

- 7) Use of a supply tank is recommended. Continuous agitation is not required in pesticide supply tanks unless tank mixing with other products or fluid fertilizers that require it.

#### **Floor (Basin), Furrow, and Border Chemigation Requirements:**

- 1) Systems using a gravity flow pesticide dispensing system must meter the pesticide into the water at the head of the field and downstream of a hydraulic discontinuity such as a drop structure or weir box to decrease potential for water source contamination from back flow if water flow stops.
- 2) Systems utilizing a pressurized water and pesticide injection system must meet the following requirements:
  - a. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow.
  - b. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
  - c. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
  - d. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
  - e. The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
  - f. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- 3) Use of a supply tank is recommended. Continuous agitation is not required in pesticide supply tanks unless tank mixing with other products or fluid fertilizers that require it.

#### **SEED TREATMENT USE INSTRUCTIONS**

Nemasan [This product] is a biochemical seed treatment that provides early season protection against listed plant parasitic nematodes, plant diseases, and insects. Nemasan also helps establish a vigorous root system that results in greater yields, more uniform foliage, and overall enhanced plant health. Nemasan must be used only in accordance with use instructions on this label utilizing conventional acceptable seed treatment techniques, provided that the equipment can be calibrated to accurately and uniformly apply the product to the seed. Nemasan [This product] is for both commercial and on-farm application. If Nemasan [this product] is used for commercial seed treatment, treated seed must be labeled in accordance with the requirements of the Federal Seed Act and applicable State seed laws. If this product is intended for seed treatment at-planting, treat only those seeds needed for immediate use, minimizing the interval between treatment and planting.

#### **Seed Quality and Storage of Treated Seed**

Seed treatments applied to low vigor, poor quality, or mechanically damaged seed may result in loss of seed germination or reduced seedling vigor. Prior to treatment of an entire seed lot, verify seed viability by treating a small portion of seed with the desired slurry mixture (Nemasan [this product] alone or in combination with other commercial seed treatment products). Utilize standard seed germination methodologies to determine and verify seed viability. Properly store treated seed. Due to seed quality and seed storage conditions beyond the control of [Organisan Corporation] [the registrant], no claims are made to guarantee the germination of carry-over treated seed.

#### **Label Requirements of Treated Seeds**

The Federal Seed Act requires that bags containing treated seed be labeled or tagged with the following information:

- This seed has been treated with chitosan and quillaja extract.

- Store treated seed away from food and feedstuffs.
- Wear long pants, long-sleeved shirt, and protective gloves when handling treated seed.

### **Mixing Instructions**

Accurate application of Nemasan [this product] to seed is required for best performance. Dilute Nemasan [this product] with water (buffered to pH 5.0 or below) or distilled water. Apply as a water-based suspension of adequate volume to distribute product uniformly over seed surface area at a rate of 1 – 8 ounces per 100 lbs seed. The volume of suspension will vary according to seed type and whether companion seed treatments are used. Thoroughly pre-mix Nemasan [product] with water to ensure a uniform suspension. To verify compatibility with other seed treatment products, pre-test tank mixtures to evaluate formulation and proper physical compatibility of products. Nemasan [This product] can be applied alone or with other seed treatment pesticides or other seed-applied products through commercial seed-treating equipment. Buffer the mixture to pH 5.0 or below before adding Nemasan [product]. Avoid storing wet seed as germination may be reduced if seed is not planted shortly after treatment.

When applied with seed treatment application equipment designed to treat seed utilizing a treatment slurry mixture, add approximately ½ to ⅔ of the required water (buffered to pH 5.0 or below or distilled) to the treatment slurry tank followed by the accompanying seed treatment products and Nemasan [this product]. The order of product addition is dependent on the accompanying seed treatment products and application equipment used. Determine required amount of each tank mix component based on rate, seed size, and amount of seed to be treated. Fill mix tank with required amount of water (pH buffered or distilled) followed by Nemasan [this product], all seed treatment components, and seed colorant (if required). Allow each slurry component to disperse completely prior to the next addition until a uniform suspension is obtained. Ensure all products are uniformly mixed prior to use. After all slurry components have been added and dispersed completely add the remaining ½ to ⅓ of required water (pH buffered or distilled) for proper slurry volume and mix until uniform. Do not store mixed slurries for greater than 24 hours. Maintain adequate agitation until treatment slurry is applied.

### **Target Pests**

Nemasan [this product] is effective against the following nematode, insect, and plant disease pests:

**Nematode Pests:** Root-lesion nematode (*Pratylenchus spp.*), Root-knot nematode (*Meloidogyne spp.*), Reniform nematode (*Rotylenchulus spp.*), Sting nematode (*Belonolaimus spp.*), Stem nematode (*Ditylenchus spp.*), Gall nematode (*Anguina spp.*), Soybean Cyst Nematode (*Heterodera spp.*), Guava nematode (*Meloidogyne spp.*), Potato cyst nematode (*Globodera spp.*)

**Fungal and Bacterial Diseases:** *Rhizoctonia spp. (R. solani)*, Garlic and Onion White Rot, Onion Pink Root Rot, *Fusarium spp. (F. oxysporium, F. solani, F. graminearum)*, *Aspergillus spp.*, *Pseudomonas spp.*, *Phytophthora spp.*, *Phytophthora gummosis*, Phytophthora Root Rot, Bacterial Soft Rot, Armillaria Root Rot, Bacterial Blast, Sooty Mold, Alternaria, Melanose, Verticillium, Curvularia, Leaf Spot, Fairy Ring, Anthracnose, Brown Patch, Gray Leaf Spot

**Insect Pests:** White flies (egg, nymph), Aphids (all life stages except adult), Thrips (egg, larvae, pre-pupal, pupal), Stink Bugs (egg, nymph), Plant Bugs (egg, nymph), Psyllids (egg, all 5 instar stages), Wireworms (egg, larvae), Corn Borers (egg, larvae), Corn Root Worm (egg, larvae instars), Southern Cow Pea Weevil (egg, larvae, maggot), Pea Weevils/Curcula (all life stages except adult), Mites (all life stages except adult), Sugarcane Aphids (all life stages except adult), Corn Ear Worm (all life stages except adult), Corn Root Maggot (all life stages except adult), Borers (all life stages), Pine Beetles, Snails (all life stages), Slugs (all life stages),

Grasshoppers (egg, nymph), Colorado Potato Beetle, Cereal Leaf Beetle, Leaf Miners, Mealy Bugs, Crickets (egg, larvae)

### Application Rates

Specific application rates are listed below per crop; however, increased application rates of up to 8 ounces Nemasen [this product] per 100 lbs seed can accommodate increased pest pressure and/or increased coating efficiency to account for differences in individual seed morphology and surface characteristics. Application rates vary per crop but do not exceed 8 oz. per 100 lbs seed. Product application by seed weight translates into different numbers of seeds within varieties and species which can affect coating efficiency. The rate ranges provided account for variances in individual seed weight, seed sizes, and seed morphology between crop species within the same group.

<b>Crop Grouping</b>	<b>Including</b>	<b>Application Rate</b>
Cereal Grains	Barley, Buckwheat, Corn (sweet and field), Millet, Oats, Quinoa, Rice, Rye (annual and cereal), Sorghum, Milo, Wheat, Grain Amaranth	1-4 oz/100 lbs seed
Berries and Small Fruit	Bayberry, Bearberry, Bilberry, Blackberry, Blueberry, Buffaloberry, Che, Chilean guava, Chokeberry, Cloudberry, Cranberry, Currant, Elderberry, Gooseberry, Grape, Huckleberry, Kiwifruit, Lingonberry, Loganberry, Mulberry, Rasperry, Strawberry	2-4 oz/100 lbs seed
Brassica (Cole) Leafy Vegetables	Broccoli, Broccoli Raab, Brussels Sprouts, Cabbage, Chinese Broccoli, Chinese Cabbage (Bok Choy), Chinese Cabbage (Napa), Chinese Mustard Cabbage (Gai Choy), Cauliflower, Cavalo Broccolo, Collards, Kale, Kohlrabi, Mizuna, Mustard Greens, Mustard Spinach, and Rape Greens	2-4 oz/100 lbs seed
Bulb Vegetables	Leek, Garlic, Onion (Bulb and Green) and Shallot	2-4 oz/100 lbs seed
Citrus	Lemon, Orange, Lime, Grapefruit, Kumquat, Pummelo, Mandarin, Satsuma	2-4 oz/100 lbs seed
Cotton		4-6 oz/100 lbs seed
Cucurbit Vegetables	Cucumber, Edible Gourds, Muskmelon, Cantaloupe, Pumpkin, Watermelon, and Winter and Summer Squash	1-4 oz/100 lbs seed
Fruiting Vegetables	Tomato, Tomatillo, Pepper, Ground cherry, Pepino, Okra and Eggplant	1-4 oz/100 lbs seed
Grass Forage, Fodder and Hay	Bermuda grass; bluegrass; and bromegrass or fescue, Bahia grass ( <i>Paspalum spp.</i> ) Orchard grass, Timothy grass, Crested Wheat Grass, Intermediate Wheat Grass	1-4 oz/100 lbs seed
Hemp		2-4 oz/100 lbs seed
Leafy Vegetables	Arugula, Celery, Corn Salad, Cress, Dandelion, Dock, Edible Chrysanthemum, Endive, Fennel, Head Lettuce, Leaf Lettuce, Parsley, Purslane, Radicchio, Rhubarb, Spinach and Swiss Chard	2-4 oz/100 lbs seed
Legume Vegetables (Succulent or Dried)	Bean (Lupinus) (includes grain lupin, sweet lupin, white lupin, and white sweet lupin); bean (Phaseolus) (includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean); bean (Vigna) (includes adzuki bean, asparagus bean, blackeyed pea, catjang, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlong bean); broad bean (fava); chickpea (garbanzo); guar; jackbean; lablab bean; lentil; pea (Pisum) (includes dwarf pea, edible-podded pea, English pea, field pea, garden pea, green pea, snowpea, sugar snap pea); pigeon pea; soybean; soybean (immature seed); sun hemp; sword bean	2-4 oz/100 lbs seed
Oilseed Crops	Rapeseed, canola, sunflower, safflower, flax seed, cottonseed, sesame, borage, calendula, castor oil plant, crambe, cuphea, echium, euphorbia, evening primrose, gold of pleasure, hare's ear mustard, jojoba, lesquerella, lunaris, meadowfoam, milkweed, mustard seed, niger seed, rose hip, oil radish, poppy seed, stokes aster, sweet rocket, tallowood, tea oil plant, vernonia	2-4 oz/100 lbs seed
Peanut		2-4 oz/100 lbs seed
Root and Tuber Vegetables	Artichoke, Black Salsify, Carrot, Cassava, Celeriac, Chayote Root, Chicory, Chinese Artichoke, Edible Burdock, Garden Beet, Ginger, Ginseng,	2-4 oz/100 lbs seed

	Horseradish, Jerusalem Artichoke, Oriental Radish, Parsnip, Potatoes, Radish, Rutabaga, Salsify, Skirret, Spanish Salsify, Sugar Beet, Sweet Potatoes, Tumeric, Turnip, Turnip-rooted Chervil, Turnip-rooted Parsley and Yams	
Sugarcane		2-4 oz/100 lbs seed
Tobacco		2-4 oz/100 lbs seed
Tree Nurseries	Christmas trees, Fir, Pine, Oak, Spruce, Noble Fir, Scotch Pine, Balsam Fir, Douglas-Fir, Elm, Ash, Hickory, Poplar, Cedar, Locust, and other tree varieties for commercial use or reforestation	2-4 oz/100 lbs seed
Turfgrass	Ornamental lawns, golf courses, sod farms	1-2 oz/100 lbs seed
Herbs and Spices	Allspice, Angelica, Anise, Star Anise, Annatto, Balm, Basil, Borage, Burnet, Camomile, Caper buds, Caraway, Cardamom, Cassia (buds and bark), Catnip, Celery seed, Chervil, Chive, Cinnamon, Clary, Clove buds, Coriander, Cilantro, Costmary, Culantro, Cumin, Curry, Dill, Fennel, Fenugreek, Grains of Paradise, Horehound, Hyssop, Juniper berry, Lavender, Lemongrass, Lovage, Mace, Marigold, Marjoram, Mustard, Nasturtium, Nutmeg, Parsley, Pennyroyal, Pepper (white and black), Rosemary, Rue, Saffron, Sage, Savory, Sweet bay, Tansy, Tarragon, Thyme, Vanilla, Wintergreen, Woodruff, Wormwood	2-4 oz/100 lbs seed
Stalk, Stem, and Leaf Petiole Vegetables	Agave, Aloe Vera, Asparagus, Bamboo shoots, Cardoon, Celery, Celtuce, Fennel, Fern, Fuki, Kale, Kohlrabi, Palm hearts, Prickly pear, Rhubarb, Udo, Zuiki	2-4 oz/100 lbs seed
Hops		2-4 oz/100 lbs seed
Nongrass Animal Feeds	Alfalfa, Velvet Bean, Clover, Lespedeza, Lupin, Sainfoin, Trefoil, Vetch (crown and milk), Bahia grass ( <i>Paspalum spp.</i> )	1-2 oz/100 lbs seed

### STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

**Pesticide Storage:** Store in a cool dry place. Avoid freezing.

**Pesticide Disposal:** To avoid wastes, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program.

**Container Handling:**

[for containers equal to or less than 5 gallons]

Nonrefillable container. Do not reuse or refill this container. Triple rinse as follows: Empty the remaining contents into application equipment or mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill or by incineration. Do not burn unless allowed by state and local ordinances.

[for containers over 5 gallons]

Non-refillable container. Do not reuse or refill this container. Triple rinse container as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill or by incineration. Do not burn unless allowed by state and local ordinances.

## NOTICE ON CONDITIONS OF SALE

By using this product, user or buyer accepts the following Conditions, Disclaimer of Warranties and Limitations of Liability.

**CONDITIONS:** The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Seller. All such risks shall be assumed by the user or buyer.

**DISCLAIMER OF WARRANTIES:** To the extent consistent with applicable law, Seller makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that extend beyond the statements made on this label. No agent of Seller is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. To the extent consistent with applicable law, Seller disclaims any liability whatsoever for special, incidental or consequential damages resulting from the use or handling of this product.

**LIMITATIONS OF LIABILITY:** To the extent consistent with applicable law, the exclusive remedy of the user or buyer for any and all losses, injuries or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at Seller election, the replacement of product.

[May be printed directly on container] (Batch)(Lot) No. \_\_\_\_\_

[Optional marketing claims]

- [Made] [Manufactured] in [the] U.S.A. [Flag Image]
- Biopesticide
- Bio-nematicide
- Bio-nematostat
- Protects against nematodes
- For Control/Suppression of Nematodes
- Not for sale (or use) in California
- Nemasan is a novel nematicide formulation made from specialized ingredients
- Apply to Turf, Fruit, Vegetables, Ornamentals, and Row Crops
- Nematode Suppression/Control
- Low Usage Rate
- Visit our website for more details!
- Nemasan.com
- OrganisanCorp.com
- This product may be applied as often as and as many times as necessary (to maintain control) (of target pests)
- Nemasan Benefits (NOTE: as a header to list other claims)
- Effective Nematode suppression/control
- No special application equipment [required]
- [Nemasan] [Product] Can be applied with your standard spray regimen
- No special spray protocol required
- Not crop specific
- Apply at any time [in] [during] [the] growing season
- Apply anytime
- Spray any time in crop cycle
- Apply foliar or fertigation
- REI of 4 hours (EPA Minimum)

- Packaged in 2.5 gallon jug, 275 gallon tote and bulk tanker
- For the protection of turfgrass (including sod farms) against damage caused by certain plant pathogenic nematodes.
- Broad spectrum control of nematodes
- Reduces populations of plant pathogenic nematodes
- Effective [early-season] control of listed insects
- Effective against aphids, thrips, psyllids, mealy bugs, leaf miners, beetles, whiteflies and other listed insects
- Effective insect control
- Suppresses insect populations
- Effective against Fusarium, Phytophthora, rots, molds, and listed crop and turf diseases
- Effective control of listed [plant diseases] [foliar [fungi/pathogens]] [soil [fungi/pathogens]]
- Effective [foliar] disease control
- Suppresses disease prevalence
- Enhanced leaf color and turf density in the presence of plant pathogenic nematodes [and fungal diseases]
- For protection against damage caused by certain plant pathogenic nematodes [and fungal diseases] [on turf and ornamentals]
- Safe to use around honey bees
- The Nematicide you have been waiting for!
- Are you fighting nematode hot spots? Try Nemasan!
- It works fast
- No respirator [required] [for application]
- Minimal PPE required to apply
- Spray over the top of this with anything!
- [For optimal results,] Organisan Corporation recommends [its adjuvant] Enhan-cer 2 and OII-YS from the O2YS Corporation. Both adjuvants have been specifically formulated for use with Nemasan [Product Name] [this product]
- Promotes the ability of plants to defend against fungal infections
- Increases germination rates
- Improves seed vitality
- Improves sprouting efficiency and vigor
- Promotes a stronger emergence
- Increases root bio-mass
- Seeds and seedlings start with incorporated chitosan leading to chitosan promoting healthier plants from the outset
- Young seedlings are healthier and can resist disease and pathogens
- [Generally] improves plant vigor
- Stimulates plant defense mechanisms
- Stimulates systemic resistance [against listed pathogens and disease]
- Activates innate immunity within the plant [from the outset of germination]
- Elevates defense response mechanisms in plants
- Promotes increased populations of soil microflora and beneficial microbes
- Effectively boosts plant resistance [against listed pathogens and disease]
- Shortens the time required for expression of mature plant resistance
- Triggers the defensive mechanisms in plants for better production
- Reducing nematode feeding, movement, reproduction and hatching.
- Effective fast acting control
- Reliable systemic control
- Works above and below ground
- Controls and suppresses nematodes
- Prevents nematodes from attacking roots
- Increases availability of nutrients in the soil

- Seed coating offers immediate protection to the seed and emerging seedling
- Stabilizes seed in storage by creating a barrier of protection
- Promotes more vigorous seedling root growth [establishment] and plant growth
- Can be used at pre planting, transplanting, post planting at any time in the growth cycle up to preharvest according to label instructions
- Protects root hairs
- [Product Name] has two active ingredients, chitosan and quillaja.
- chitosan and quillaja act synergistically.
- Chitosan is a polymer similar to cellulose. Chitosan acts in two ways with seed treatment while the seed is being coated, some of the chitosan is imbibed through the seed coat. This fortifies the seed in many ways
- Seal endosperm to inhibit desiccation.
- Stimulates germinating seed to produce phytoalexins for increased seed health in new seedlings.
- Stimulates newly emerged seedlings to increase chlorophyll content.
- Stimulates newly emerged seedlings to increase chitinase production for increased antifeedants against insects.
- Helps to control stomata openings in newly emerged seedlings for transpiration control.
- Residual chitosan on the seed surface is also active
- Improves adhesion of additional seed treatment compounds.
- Stimulates and increases microbial activity in soil adjacent to the treated seed.
- Provides protection against seed borne diseases and newly emerged seedlings.
- Provides improved seed handling flow during planting to inhibit sticking or clumping together of seed.
- Helps prevent damage to seed coat during handling, storage, and planting.
- Provides nematode suppression.
- Quillaja is an extract containing natural surfactants called saponins.
- Quillaja saponins also act in two main ways in [Product Name]
- Surfactant nature lowers surface tension and facilitates chitosan being imbibed
- Quillaja saponins have known nematicidal, fungicidal and larvicidal properties.
- Residual quillaja on the surface can leach into the immediate soil environment at planting affording valuable protection. Working in concert with the chitosan
- Quillaja also shown to enhance germination rates
- Imbibes thru the seed coat to seal endosperm to inhibit desiccation.
- Stimulates germinating seed to produce phytoalexins for increased seed health in new seedlings.
- Stimulates newly emerged seedlings to increase chlorophyll content.
- Stimulates newly emerged seedlings to increase chitinase production for increased antifeedants against insects.
- Helps to control stomata openings in newly emerged seedlings for transpiration control.
- Improves adhesion of additional seed treatment compounds.
- Stimulates and increases microbial activity in soil adjacent to the treated seed.
- Provides protection against seed borne diseases and newly emerged seedlings.
- Provides improved seed handling flow during planting to inhibit sticking or clumping together of seed.
- Helps prevent damage to seed coat during handling, storage, and planting.
- Provides nematode, listed insect/ plant pest suppression.
- Images of target pest (i.e. nematode) with circle-backslash symbol (no sign, prohibition sign)

